

Anticipation under Section 102 of the Patent Act requires that a prior art reference disclose every claim element of the claimed invention. See, e.g., Orthokinetics, Inc. v. Safety Travel Chairs, Inc., 806 F.2d 1565, 1574 (Fed. Cir. 1986). While other references may be used to interpret an allegedly anticipating reference, anticipation must be found in a single reference. See, e.g., Studiengesellschaft Kohle, G.m.b.H. v. Dart Indus., Inc., 726 F.2d 724, 726-27 (Fed. Cir. 1984). The absence of any element of the claim from the cited reference negates anticipation. See, e.g., Structural Rubber Prods. Co. v. Park Rubber Co., 749 F.2d 707, 715 (Fed. Cir. 1984). Anticipation is not shown even if the differences between the claims and the prior art reference are insubstantial and the missing elements could be supplied by the knowledge of one skilled in the art. See, e.g., Structural Rubber Prods., 749 F.2d at 716-17.

Claim 1 has been amended above to recite more specifically that the magnetic armature wedge structure includes a molded body having a magnetic core and a resin part encapsulating the magnetic core. It is respectfully submitted that Myers does not anticipate nor render obvious the structure recited in amended claim 1. Indeed, Myers teaches an armature wedge structure including a molded body of resin material having a magnetic material incorporated therein. However, Myers does not anticipate or in any respect suggest the provision of a magnetic core encapsulated within a resin. In this regard, in the embodiment of Figures 1 and 3, about 1/2 of his wedge is formed as a band or layer of resin incorporating magnetic material. In the embodiment of Figure 4, about 1/3 of his wedge is formed from resin and magnetic material as a central layer. In the embodiment of Figures 5 and 6, the entire resin part of the wedge incorporates magnetic material. Although Figures 5 and 6 show a core structure, the core is not magnetic. In Figure 5, the core is of fiber or other suitable material 14, provided for the purpose of reinforcing the wedge. In the embodiment of Figure 6, parallel strips of cloth 15 and 16 are embedded in the magnetic mixture for reinforcement.

Thus, Myers in no way teaches or suggests the concept of encapsulating a magnetic core in a resin material, but teaches only a structure wherein the magnetic

material is distributed in the resin material as a layer of or the entire molded part of the wedge. Thus, contrary to the Examiner's characterization of column 2, lines 40-50 of Myers, the embodiments of Figures 1 and 2 of Myers does not provide a magnetic core encapsulated by a resin as claimed. Accordingly, claim 1 is not anticipated.

Claim 2 provides that a magnetic wedge slide is disposed adjacent the magnetic armature wedge structure. Contrary to the Examiner's characterization of Myers, there is no apparent teaching or suggestion of a wedge slide adjacent the magnetic armature wedge structure, much less a magnetic wedge side as required by applicant's claim 2 and also by new independent claim 20, which corresponds to original claim 2.

In view of the foregoing, reconsideration and withdrawal of the anticipatory rejection over Myers is requested.

The invention claimed is not obvious from Myers either.

In order to prove obviousness, a challenger must present prior art references which disclose the claimed subject matter of the patent/application in question. If separate prior art references each disclose separate elements of a claim, the challenger must also show some teaching, suggestion, or incentive in the prior art that would have led one of ordinary skill in the art to make the claimed combination. See, e.g., Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 297 n.24, 304-05 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986). In determining obviousness, there must be some reason other than hindsight for selectively combining the prior art references to render the claimed invention obvious. See, e.g., Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1143 (Fed. Cir. 1985).

The Examiner characterizes Myers as teaching a magnetic core 14 and asserts that it would be "obvious" to change the shape of that core from rectangular to circular. First, as noted above, element 14 of Myers is not a magnetic core. Element 14 is described as a strip of fiber or other suitable material for reinforcing the "stick". The magnetic portion of the stick is the mixture of binder and magnetic material that forms

the remainder of the stick, as described on page 2, column 1, lines 23-33. Therefore, the Examiner's assertion that a modified core shape of the Figure 5 embodiment of Myers would meet the limitations of applicant's claims is not true.

It is further respectfully submitted that the embedding or encapsulation of a magnetic material/core in a resin as claimed has substantial and unanticipated advantages over the magnetic wedge structures of Myers. In this regard, in normal operation of a generator, the stator conductors in the slots carry large currents and are subjected to large magnetic fields. They therefore experience very high electromagnetic forces tending to displace them within the slots. In order to firmly secure the conductors in the slots, it is conventional to provide dovetail shaped wedge portions in the slots.

Thus, the wedge design involves the trade-off between the mechanical strength and magnetic properties of the wedge. From the standpoint of mechanical strength, it is desirable to use a single-component, high strength material (e.g., resin) to make the wedge. This is defined as the "prior art" in the subject application. However, such a wedge does not in any way improve the magnetic field. On the other hand, from the standpoint of magnetic properties, it would be desirable to use a mixture of ferromagnetic material and resin to make the entire wedge. To obtain high magnetic flux density, it would be desirable to make wedges with high magnetic volumetric mixing ratios. However, test results have shown that the wedge strength is inversely proportional to the volumetric mixing ratio. That is, the more the ferromagnetic particles, the lesser the mechanical strength. Thus, the requirement of the wedge strength limits the volumetric mixing ratio.

Applicants have discovered that an effective way to solve this problem is to provide a magnetic core that is encapsulated within a high-strength material (e.g. resin). In such an assembly, the resin part is provided to withstand forces acting on the wedge and the magnetic core is used to improve the magnetic field. As such, the invention as recited, e.g., in claim 1, provides substantial advantages over a wedge

formed from a mixture of ferromagnetic material and resin which to have sufficient mechanical strength will necessarily have a low volumetric mixing ratio.

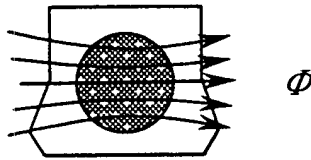
The prior art usually refers to the magnetic weight ratio $\frac{W_{mag}}{W_{resin}}$ rather than volumetric mixing ratio $\frac{V_{mag}}{V_{mag} + V_{resin}}$ in making wedges. The relation between these two can be written as

$$\eta_{mag} = \frac{V_{mag}}{V_{mag} + V_{resin}} = \frac{1}{1 + \frac{\rho_{mag}}{\rho_{resin}} \left(\frac{W_{resin}}{W_{mag}} \right)}$$

This indicates that for a large weight ratio, the volumetrically ratio would be very small. For instance, a weight ratio of 80% corresponds to a volumetric ratio of only 13.2%. A significant advantage of the invention is that because the magnetic core is not designed to withstand electromagnetic forces, the magnetic mixing ratio can be very high (greater than 60%) and thus particularly effectively improve the magnetic field. Thus, it is possible for the magnetic flux density to be much higher than in the prior art such as in Myers. In addition, the magnetic flux provided by the inventive structure is relatively uniform due to both the high η_{mag} value possible and the magnetic core shape.

In this regard, even if Myers taught a magnetic core as claimed in claim 1, it is respectfully submitted that the provision of a core having a circular cross-section as recited in original claim 11 (and new independent claim 30) would not be anticipated by nor obvious. A magnetic core having a circular cross section as recited in e.g., claims 11 and 30 provides substantial and unanticipated advantages over other core shapes (which is submitted are not in any event taught or suggested by Myers). More particularly, if a core of rectangular or triangular shape is provided, it would result in

high stress concentrations at the corners. Thus, a further advantage of the invention is that the circular shape introduces no stress concentration in the assembly. It will also be appreciated that the magnetic flux through a circular core as provided in a preferred embodiment of the invention can provide a relatively uniform flux as compared to the layered embodiments of Myers as shown below.



Magnetic flux through the magnetic core in our innovation

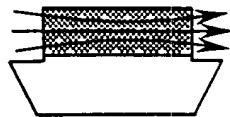


Fig. 3 (Myers)

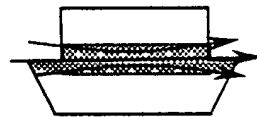


Fig. 4 (Myers)

As can be seen, in Myers, the magnetic fluxes pass only through a portion of the wedge. In addition, as noted above, the configurations of Figs. 3 and 4 cause mechanical strength problems.

In view of the foregoing, reconsideration and withdrawal of the rejections over Myers are requested.

Attached is a Form PTO-1449 listing the enclosed documents.

The listed documents were cited in an Official Action dated July 31, 2002 in Applicant's divisional application No. 10/101,393 (copy attached). Should a fee be required for these documents to be considered, please charge that fee to our Deposit Account No. 14-1140 under Order No. 839-854 and proceed to consider this Information Disclosure Statement.

This Information Disclosure Statement is intended to be in full compliance with the rules, but should the Examiner find any part of its required content to have been omitted, prompt notice to that effect is earnestly solicited, along with additional time under Rule 97(f), to enable Applicant to comply fully.

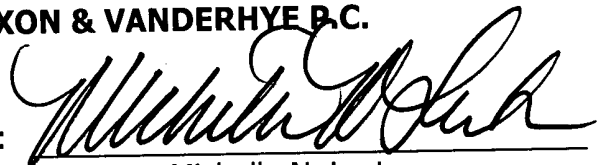
Consideration of the foregoing and enclosures plus the return of a copy of the herewith Form PTO-1449 with the Examiner's initials in the left column per MPEP 609 are earnestly solicited.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance and an early Notice to that effect is earnestly solicited.

Respectfully submitted,

NIXON & VANDERHYE P.C.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/101,393	03/20/2002	Wei Tong	839-1188	8029

7590 07/31/2002
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EXAMINER

LAM, THANH

ART UNIT PAPER NUMBER

2834

DATE MAILED: 07/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

DOCKETED

CLT/MATTER # 839-1188
MAIL DATE 7-31-02
DUE DATE Oct 31, 2002
FINAL DEADLINE Jan 31, 2003
DOCKETED BY pat/mis

RECEIVED
OCT 28 2002
TECHNOLOGY CENTER 2000

Office Action Summary

Application No.
10/101,393

Applicant(s)

Tong et al.

Examiner
Thanh Lam

Art Unit
2834

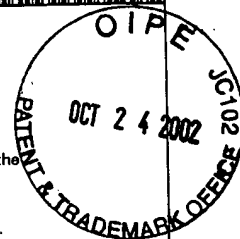


-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).



Status

- 1) ☒ Responsive to communication(s) filed on Election filed on 6/20/2002
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-19 is/are pending in the application.
- 4a) Of the above, claim(s) 14-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12, 13, 18, and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. _____
- ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 3
- ☐ Interview Summary (PTO-413) Paper No(s). _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

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Art Unit: 2834



DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 12-13 and 18-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Keuth et al.

Keuth et al. disclose a method of increasing generator for subtransient reactance comprising disposing a magnetic assembly including providing at least one of a magnetic armature wedge structure (5) and magnetic wedge slide (4) in an armature slot for retaining armature coil (2) components therewithin, thereby defining a magnetic flux bridge to increase armature slot leakage flux and thereby increase armature slot leakage reactance (the wedge and slide composition of iron (magnetic material) and plastic, the magnetic material that increases the flux bridge).

Regarding claim 13, Keuth et al. disclose the step of providing a magnetic armature wedge structure comprises providing a molded wedge having a magnetic material embedded there thin.

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Regarding claim 18, Keuth et al. disclose the magnetic material embedded in said molded body of said magnetic armature wedge structure comprises a magnetic core made from mixing resin and ferromagnetic particles.

Regarding claim 19, Keuth et al. disclose magnetic wedge slide is formed from resin having ferromagnetic particles distributed therethrough.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Lam whose telephone number is (703) 308-7626. The fax phone number for this Group is (703) 305-3432.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0656.



Thanh Lam

Patent Examiner

July 26, 2002

Notice of References Cited

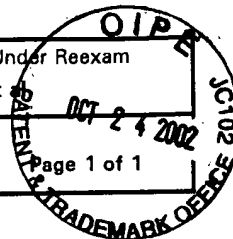
Application/Control No.
10/101,393

Applicant(s)/Patent Under Reexam
Tong et al.

Examiner
Thanh Lam

Art Unit
2834

Page 1 of 1



U.S. PATENT DOCUMENTS

	Document Number Country Code-Number-Kind Code	Date MM-YYYY ¹	Name	Classification ²	
A	3,447,009	3/1965	Keuth et al.	310	214
B	5,214,839	6/1993	Rieber et al.	29	596
C	3,093,764	7/1960	King et al.	310	214
D	3,976,902	8/1976	Simmonds	310	214
E	3,437,858	4/1969	White	310	214
F					
G					
H					
I					
J					
K					
L					
M					

FOREIGN PATENT DOCUMENTS

	Document Number Country Code-Number-Kind Code	Date MM-YYYY ¹	Country	Name	Classification ²	
N						
O						
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NON-PATENT DOCUMENTS

	Include, as applicable: Author, Title, Date, Publisher, Edition or Volume, Pertinent Pages				
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* A copy of this reference is not being furnished with this Office action. See MPEP § 707.05(a).

¹ Dates in MM-YYYY format are publication dates.

² Classifications may be U.S. or foreign.

